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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/766,151 | 01/19/2001 | Terry M. Turpin | 509622000400 | 1278 |

25227 7590 06/28/2004
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| EXAMINER |
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WILSON, ROBERT W

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| ART UNIT | PAPER NUMBER |
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2661

DATE MAILED: 06/28/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/766,151

Applicant(s)

TURPIN ET AL.

Examiner

Robert W Wilson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>4&5</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1.0 The application of Turpin et. al. entitled "OPTICAL PROCESSOR ENHANCED RECEIVER ARCHITECTURE (OPERA)" filed on 1/19/2001 with priority based upon 60/209,434 dated 06/02/2000. Claims 1-13 are pending.

Claim Rejections - 35 USC § 103

2.0 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3.0 **Claims 1-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (U.S. Patent No.: 5,719,852 which is an IDS document of record) in view of Turpin (U.S. Patent No.: 4,225,938 which is also an IDS document of record)

Referring to **Claim 1**, Schilling (U.S. Patent No.: 5,719,852) teaches: A multiple user communication system (Communication system per Figs 12-13 containing correlators per Figures 1-4. "multiple user" is defined only in the preamble and not in the claim; therefore, "multiple user" reflects intended use and is given no weight), comprising:

At least one receiver for receiving a plurality of signals (Fig 5 or 12 & 13 or receiver for multiple access or plurality of signals per Abstract)

At least one optical processor for optically correlating at least one of the plurality of received signals simultaneously against a plurality of hypothesized signals to generate data comprising a plurality of correlations (Figures 5 or 12 which contains correlators per Figs 1-4)

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At least one receiver algorithm for applying to the data generated by the optical processor for at least one of identifying, sorting and separating the plurality of received signals based upon the generated plurality of correlations (Figure 13)

Schilling (U.S. Patent No.: 5,719,852) does not expressly call for: optical processor but teaches interference cancelers per Figs 5 or 12 which contain correlators per Figs 1-4.

Turpin teaches optical processor or processor which performs correlation optically per Figs 1-7 which can be utilized in a large data rate applications per col. 1 lines 30-40.

It would have been obvious to add the optical processors or optical correlators of Turpin in place of the correlators of Schilling because optical correlators are less expensive and performs less calculation per Turpin per col. 1 line 1-col. 2 line 65.

Referring to **Claim 9**, Schilling (U.S. Patent No.: 5,719,852) teaches: A method of reducing interference (Figs 12 & 13 method, col. 2 lines 17-32 or interference) in a multiple user communication system (communication system per Figs 12-13 containing correlators per Figures 1-4. "multiple user" is defined only in the preamble and not in the claim; therefore, "multiple user" reflects intended use and is given no weight)

Receiving a plurality of signals (41 per Fig 12)

Optical correlating at least one of the plurality of received signals simultaneously against a plurality of hypothesized signals to generate data comprising a plurality of correlations (Interference Cancellers per Figs 5 or 12 which contain correlators per Figs 1-4 performs correlations on a plurality of signals)

Whereby interference among the plurality of received signals is reduced (Interference per col. 2 lines 17-32)

Schilling (U.S. Patent No.: 5,719,852) does not expressly call for: optical correlation but teaches interference cancellers which performs correlation per Figs 5 or 12 & which contain correlators per Figs 1-4.

Turpin teaches optical correlation per Figs 1-7 which can be utilized in a large data rate applications per col. 1 lines 30-40.

It would have been obvious to add the optical correlation of Turpin in place of the correlators of Schilling because optical correlation is less expensive and performs less calculations per Turpin per col. 1 line 1-col. 2 line 65.

In Addition Turpin teaches:

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Regarding **Claim 2**, comprising a controller for providing the plurality of hypothesized signals to the optical processor (10 per Fig 1 or 20 per 2 or optical controller)

Regarding **Claim 3**, wherein the optical processor comprises a plurality of one-dimensional optical correlators for generating an output comprising a two dimensional correlation matrix (Fig 1 or one dimensional or Fig 2 or two dimensional)

Regarding **Claim 4**, comprising a converter for converting the plurality of received signals into a suitable form suitable for input to the optical processor (10 per Fig 1 or 20 per Fig 2)0

In Addition Schilling teaches:

Regarding **Claim 5 & 10**: wherein the receiver algorithm comprises a signal-to-noise enhancement algorithm (col. 1 lines 35-36)

Regarding **Claims 6 & 11**, wherein the receiver algorithm performs at least one of the multi-user detections, multipath combining and doppler compensation (The examiner takes official notice that multi-user detection is well known in the art per Verdu' entitled "Multi-User Detection" per Pgs 391-407 & Pgs 391-407 which is an IDS document of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the "multiple user detection" system of Verdu' in order to perform multiple access of Schilling per Abstract)

Regarding **Claims 7 & 12**, wherein the receiver algorithm comprises a complex multi-user receiver algorithm (The examiner takes official notice that multi-user detection is well known in the art per Verdu' entitled "Multi-User Detection" per Pgs 391-407 & Pgs 391-407 which is an IDS document of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the "multiple user detection" algorithm of Verdu' in order to perform multiple access of Schilling per Abstract)

Regarding **Claims 8 & 13**, wherein the multiple user communication system comprises a DS/SS CDMA communication system and wherein the receiver algorithm comprises a Multiple User Detection (MUD) algorithm (The examiner takes official notice that multi-user detection is well known in the art per Verdu' entitled "Multi-User Detection" per Pgs 391-407 & Pgs 391-407 which is an IDS document of record. It would have been obvious to one of ordinary skill in the art at the time of the invention to implement the "multiple user detection" system of Verdu' in order to perform multiple access of Schilling per Abstract.)

Drawings

4.0 The drawings in this application are objected to by the Draftsperson as informal. Any drawing corrections requested, but not made in the prior application should be repeated in this

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application if such changes are still desired. If the drawings were changed and approved during the prosecution of the prior application, a petition may be filed under 37 CFR 1.182 requesting the transfer of such drawings, provided the parent application has been abandoned. However, a copy of the drawings as originally filed must be included in the 37 CFR 1.60 application papers to indicate the original content.

Conclusion

5.0 Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert W Wilson whose telephone number is 703/305-4102. The examiner can normally be reached on M-F (8:00-4:30).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Olms can be reached on (703) 305-4703. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.



Robert W Wilson
Examiner
Art Unit 2661

RWW
May 17, 2004



DANGLTON
PATENT EXAMINER